

CLAIMS

What is claimed is:

1. A protective pad apparatus for protecting a user's chest, back, and shoulders, the apparatus comprising:
a shell assembly; and
a cushioning pad fastened to the shell assembly, the cushioning pad comprising a laminate having at least one impact absorbing layer which allows air to flow therethrough.
2. The protective pad apparatus according to claim 1, wherein the laminate further comprises an outer fabric layer.
3. The protective pad apparatus according to claim 2, wherein the outer fabric layer allows air to flow therethrough.
4. The protective pad apparatus according to claim 2, wherein the outer fabric layer functions as a radiant heat barrier.
5. The protective pad apparatus according to claim 4, wherein the outer fabric layer comprises an aluminized polyester.
6. The protective pad apparatus according to claim 2, wherein the laminate further comprises an inner fabric layer.

7. The protective pad apparatus according to claim 6, wherein the inner fabric layer allows air to flow therethrough.

8. The protective pad apparatus according to claim 1, wherein the laminate further comprises an inner fabric layer.

9. The protective pad apparatus according to claim 8, wherein the inner fabric layer allows air to flow therethrough.

10. A protective pad apparatus for protecting a user's chest, back, and shoulders, the apparatus comprising:

a shell assembly; and

a cushioning pad fastened to the shell assembly, the cushioning pad comprising a laminate having at least two impact absorbing layers, at least one of the at least two impact absorbing layers allowing air to flow therethrough.

11. The protective pad apparatus according to claim 10, wherein one of the at least two impact absorbing layers comprises at least one substrate of reticulated foam.

12. The protective pad apparatus according to claim 11, wherein the at least one substrate of reticulated foam has a black color.

13. The protective pad apparatus according to claim 11, wherein the other one of the at least two impact absorbing layers comprises at least one substrate of foam beads that are fused together only where the beads contact one another.
14. The protective pad apparatus according to claim 13, wherein the laminate further comprises an outer fabric layer, the outer fabric layer allowing air to flow therethrough.
15. The protective pad apparatus according to claim 14, wherein the laminate further comprises an inner fabric layer, the inner fabric layer allowing air to flow therethrough.
16. The protective pad apparatus according to claim 13, wherein the laminate further comprises an inner fabric layer, the inner fabric layer allowing air to flow therethrough.
17. The protective pad apparatus according to claim 10, wherein the laminate further comprises an outer fabric layer, the outer fabric layer allowing air to flow therethrough.
18. The protective pad apparatus according to claim 17, wherein the outer fabric layer faces toward the shell assembly and comprises a light color.
19. The protective pad apparatus according to claim 10, wherein the laminate further comprises an inner fabric layer, the inner fabric layer allowing air to flow therethrough.

20. The protective pad apparatus according to claim 19, wherein the inner fabric layer faces away from the shell assembly and comprises a dark color.
21. The protective pad apparatus according to claim 10, wherein one of the at least two impact absorbing layers comprises at least one substrate of foam beads which are fused together only where the beads contact one another.
22. The protective pad apparatus according to claim 10, wherein the laminate further comprises a radiant heat barrier layer.
23. The protective pad apparatus according to claim 21, wherein the radiant heat barrier layer comprises an aluminized polyester.
24. A protective pad apparatus for protecting a user's chest, back, and shoulders, the apparatus comprising:
- a shell assembly; and
 - a cushioning pad fastened to the shell assembly, the cushioning pad comprising a laminate having at least three impact absorbing layers, at least one of the three impact absorbing layers allowing air to flow therethrough.
25. The protective pad apparatus according to claim 24, wherein one of the at least three impact absorbing layers comprises at least one substrate of reticulated foam.

26. The protective pad apparatus according to claim 25, wherein the at least one substrate of reticulated foam has a black color.

27. The protective pad apparatus according to claim 25, wherein a second one of the at least three impact absorbing layers comprises at least one substrate of foam beads which are fused together only where the beads contact one another.

28. The protective pad apparatus according to claim 27, wherein a third one of the at least three impact absorbing layers comprises at least one substrate of visco-elastic polymer.

29. The protective pad apparatus according to claim 28, wherein the at least one substrate of visco-elastic polymer includes at least one air ventilation aperture.

30. The protective pad apparatus according to claim 28, wherein the laminate further comprises an outer fabric layer, the outer fabric layer allowing air to flow therethrough.

31. The protective pad apparatus according to claim 30, wherein the laminate further comprises an inner fabric layer, the inner fabric layer allowing air to flow therethrough.

32. The protective pad apparatus according to claim 28, wherein the laminate further comprises an inner fabric layer, the inner fabric layer allowing air to flow therethrough.

33. The protective pad apparatus according to claim 24, wherein one of the at least three impact absorbing layers comprises at least one substrate of foam beads which are fused together only where the beads contact one another.
34. The protective pad apparatus according to claim 24, wherein one of the at least three impact absorbing layers comprises at least one substrate of visco-elastic polymer.
35. The protective pad apparatus according to claim 34, wherein the at least one substrate of visco-elastic polymer includes at least one air ventilation aperture.
36. The protective pad apparatus according to claim 24, wherein the laminate further comprises a radiant heat barrier layer.
37. The protective pad apparatus according to claim 36, wherein the radiant heat barrier layer comprises an aluminized polyester.
38. The protective pad apparatus according to claim 24, wherein the laminate further comprises an outer fabric layer, the outer fabric layer allowing air to flow therethrough.
39. The protective pad apparatus according to claim 38, wherein the outer fabric layer faces toward the shell assembly and comprises a light color.

40. The protective pad apparatus according to claim 24, wherein the laminate further comprises an inner fabric layer, the inner fabric layer allowing air to flow therethrough.
41. The protective pad apparatus according to claim 40, wherein the inner fabric layer faces away from the shell assembly and comprises a dark color.
42. The protective pad apparatus according to claim 24, further comprising at least a second cushioning pad detachably fastened to an inner surface of the cushioning pad, the at least second cushioning pad comprising a laminate having at least one impact absorbing layer which allows air to flow therethrough.
43. The protective pad apparatus according to claim 42, wherein the laminate of the at least second cushioning pad further comprises outer and inner fabric layers.
44. The protective pad apparatus according to claim 43, wherein the outer and inner fabric layers of the laminate of the at least second cushioning pad each allow air to flow therethrough.
45. The protective pad apparatus according to claim 44, wherein the outer fabric layer of the laminate of the at least second cushioning pad faces toward the inner surface of the cushioning pad and comprises a light color and the inner fabric layer of the laminate of the at least second cushioning pad faces away from the inner surface of the cushioning pad and comprises a dark color.

46. The protective pad apparatus according to claim 1, wherein the cushioning pad comprises one of a plurality of discrete cushioning pads forming a cushioning pad assembly.
47. The protective pad apparatus according to claim 10, wherein the cushioning pad comprises one of a plurality of discrete cushioning pads forming a cushioning pad assembly.
48. The protective pad apparatus according to claim 24, wherein the cushioning pad comprises one of a plurality of discrete cushioning pads forming a cushioning pad assembly.
49. The protective pad apparatus according to claim 1, wherein the shell assembly comprises a plurality of discrete protector panels.
50. The protective pad apparatus according to claim 10, wherein the shell assembly comprises a plurality of discrete protector panels.
51. The protective pad apparatus according to claim 24, wherein the shell assembly comprises a plurality of discrete protector panels.
52. The protective pad apparatus according to claim 1, wherein the cushioning pad is fastened to the shell assembly with at least one snap fastener.

53. The protective pad apparatus according to claim 10, wherein the cushioning pad is fastened to the shell assembly with at least one snap fastener.
54. The protective pad apparatus according to claim 24, wherein the cushioning pad is fastened to the shell assembly with at least one snap fastener.
55. The protective pad apparatus according to claim 1, wherein shell assembly includes first and second halves.
56. The protective pad apparatus according to claim 55, wherein the first and second halves are connected by a first protector plate.
57. The protective pad apparatus according to claim 56, wherein the first protector plate allows the first and second halves of the shell assembly to move relative to one another.
58. The protective pad apparatus according to claim 56, wherein the first and second halves are further connected by a second protector plate.
59. The protective pad apparatus according to claim 58, wherein the protector plates allow the first and second halves of the shell assembly to move relative to one another.

60. The protective pad apparatus according to claim 55, wherein the first and second halves of the shell assembly are connected to one another in a manner which allows the halves to move relative to one another.

61. The protective pad apparatus according to claim 49, wherein shell assembly includes first and second halves.

62. The protective pad apparatus according to claim 61, wherein the first and second halves are connected by a first protector plate.

63. The protective pad apparatus according to claim 62, wherein the first protector plate allows the first and second halves of the shell assembly to move relative to one another.

64. The protective pad apparatus according to claim 62, wherein the first and second halves are further connected by a second protector plate.

65. The protective pad apparatus according to claim 64, wherein the protector plates allow the first and second halves of the shell assembly to move relative to one another.

66. The protective pad apparatus according to claim 61, wherein the first and second halves of the shell assembly are connected to one another in a manner which allows the halves to move relative to one another.

67. The protective pad apparatus according to claim 1, further comprising a belt strap system for securing the apparatus to a user, the belt strap system comprising at least one cushioning pad comprising a laminate having at least one impact absorbing layer which allows air to flow therethrough.
68. The protective pad apparatus according to claim 1, wherein the shell assembly includes a plurality of raised embossments.
69. The protective pad apparatus according to claim 49, wherein at least one of the protector panels includes at least one raised embossment.
70. The protective pad apparatus according to claim 49, wherein the protector panels comprise at least one chest protector panel that includes at least one raised embossment.
71. The protective pad apparatus according to claim 49, wherein the protector panels comprise at least one back protector panel that includes at least one raised embossment.
72. The protective pad apparatus according to claim 49, wherein the protector panels comprise at least one inner shoulder protector panel that includes at least one raised embossment.
73. The protective pad apparatus according to claim 1, wherein the shell assembly comprises a pearlized white metallic color.

74. The protective pad apparatus according to claim 1, wherein the shell assembly comprises a plurality of ventilation holes.

75. The protective pad apparatus according to claim 1, further comprising at least one spring element for strengthening an inner shoulder portion of the shell assembly.

76. The protective pad apparatus according to claim 75, wherein the at least one spring element is fastened to the shell assembly with fasteners that allow the at least one spring element to swing laterally.

77. The protective pad apparatus according to claim 75, wherein the at least one spring element includes an impact absorbing layer.

78. The protective pad apparatus according to claim 49, further comprising at least one spring element for strengthening an inner shoulder portion of the shell assembly.

79. The protective pad apparatus according to claim 78, wherein the at least one spring element is fastened to the shell assembly with fasteners that allow the at least one spring element to swing laterally.

80. The protective pad apparatus according to claim 78, wherein the at least one spring element includes an impact absorbing layer.

81. The protective pad apparatus according to claim 1, wherein the shell assembly includes a lower shoulder panel fastened to an inner shoulder area by two straps that cross one another.

82. The protective pad apparatus according to claim 49, wherein the protector panels comprise a lower shoulder protector panel and an inner shoulder protector panel, the lower shoulder protector panel fastened to the inner shoulder protector panel by two straps that cross one another.

83. The protective pad apparatus according to claim 49, wherein at least one of the protector panels comprises a plurality of ventilation holes.

84. The protective pad apparatus according to claim 49, wherein each of the protector panels has at least one of a predetermined size and a predetermined shape and wherein each of the protector panels can be individually replaced with a protector panel having one of at least a different predetermined size and a different predetermined shape.

85. The protective pad apparatus according to claim 49, wherein the cushioning pad comprises one of a plurality of discrete cushioning pads forming a cushioning pad assembly.

86. The protective pad apparatus according to claim 85, wherein each of the protector panels having at least one of a predetermined size and a predetermined shape and each of the protector panels being individually replaceable with a protector panel having at least one of a different predetermined size and a different predetermined shape.

87. The protective pad apparatus according to claim 86, wherein each of the cushioning pads having a predetermined size and a predetermined shape and each of the cushioning pads being individually replaceable with a cushioning pad having at least one of a different predetermined size and a different predetermined shape.

88. The protective pad apparatus according to claim 85, wherein each of the cushioning pads having a predetermined size and a predetermined shape and each of the cushioning pads being individually replaceable with a cushioning pad having at least one of a different predetermined size and a different predetermined shape.

89. The protective pad apparatus according to claim 1, wherein the cushioning pad comprising one of a plurality of discrete cushioning pads forming a cushioning pad assembly, each of the cushioning pads having a predetermined size and a predetermined shape and each of the cushioning pads being individually replaceable with a cushioning pad having at least one of a different predetermined size and a different predetermined shape.

90. A cushioning pad for use with a protective pad apparatus that protects a user's chest, back, and shoulders, the cushioning pad comprising:

a laminate having at least one impact absorbing layer that allows air to flow therethrough.

91. The cushioning pad according to claim 90, wherein the at least one impact absorbing layer comprises at least one substrate of reticulated foam.
92. The cushioning pad according to claim 91, wherein the at least one substrate of reticulated foam has a black color.
93. The cushioning pad according to claim 90, wherein the at least one impact absorbing layer comprises at least one substrate of foam beads which are fused together only where the beads contact one another.
94. The cushioning pad according to claim 90, wherein the at least one impact absorbing layer comprises at least one substrate of visco-elastic polymer.
95. The cushioning pad according to claim 94, wherein the at least one substrate of visco-elastic polymer includes at least one air ventilation aperture.
96. The cushioning pad according to claim 90, wherein the laminate further comprises at least one substrate of visco-elastic polymer.
97. The cushioning pad according to claim 90, wherein the laminate further comprises an outer fabric layer, the outer fabric layer allowing air to flow therethrough.

98. The cushioning pad according to claim 97, wherein the laminate further comprises an inner fabric layer, the inner fabric layer allowing air to flow therethrough.

99. The cushioning pad according to claim 90, wherein the laminate further comprises an inner fabric layer, the inner fabric layer allowing air to flow therethrough.

100. The cushioning pad according to claim 90, wherein the laminate further comprises a radiant heat barrier layer.

101. The cushioning pad according to claim 100, wherein the radiant heat barrier layer comprises an aluminized polyester.

102. The cushioning pad according to claim 90, wherein the at least one impact absorbing layer comprises two impact absorbing layers, the two impact absorbing layers including at least one impact absorbing layer comprises at least one substrate of reticulated foam and at least one substrate of foam beads which are fused together only where the beads contact one another.

103. The cushioning pad according to claim 102, wherein the laminate further comprises outer and inner fabric layers, the outer and inner fabric layers each allowing air to flow therethrough.

104. The cushioning pad according to claim 102, wherein the laminate further comprises a radiant heat barrier layer.

105. The cushioning pad according to claim 102, wherein the laminate further comprises a third impact absorbing layer, the third impact absorbing layer including at least one substrate of visco-elastic polymer.

106. The cushioning pad according to claim 105, wherein the at least one substrate of visco-elastic polymer includes at least one air ventilation aperture.

107. The cushioning pad according to claim 102, wherein the laminate further comprises at least one substrate of visco-elastic polymer.

108. The cushioning pad according to claim 107, wherein the at least one substrate of visco-elastic polymer includes at least one air ventilation aperture.

109. The cushioning pad according to claim 97, wherein the outer fabric layer faces toward the shell assembly and comprises a light color.

110. The cushioning pad according to claim 99, wherein the inner fabric layer faces away from the shell assembly and comprises a dark color.

111. The cushioning pad according to claim 90 in combination with at least a second cushioning pad detachably fastened to an inner surface of the cushioning pad, the at least second cushioning pad comprising a laminate having at least one impact absorbing layer which allows air to flow therethrough.

112. A cushioning pad assembly for use with a protective pad apparatus that protects a user's chest, back, and shoulders, the cushioning pad assembly comprising

a plurality of discrete cushioning pads, at least one of the plurality of discrete cushioning pads comprising a laminate having at least one impact absorbing layer that allows air to flow therethrough.

113. The cushioning pad assembly according to claim 113, wherein the at least one impact absorbing layer comprises at least one substrate of reticulated foam.

114. The cushioning pad assembly according to claim 114, wherein the at least one substrate of reticulated foam has a black color.

115. The cushioning pad assembly according to claim 113, wherein the at least one impact absorbing layer comprises at least one substrate of foam beads which are fused together only where the beads contact one another.

116. The cushioning pad assembly according to claim 113, wherein the at least one impact absorbing layer comprises at least one substrate of visco-elastic polymer.

117. The cushioning pad assembly according to claim 117, wherein the at least one substrate of visco-elastic polymer includes at least one air ventilation aperture.

118. The cushioning pad assembly according to claim 113, wherein the laminate further comprises at least one substrate of visco-elastic polymer.
119. The cushioning pad assembly according to claim 113, wherein the laminate further comprises an outer fabric layer, the outer fabric layer allowing air to flow therethrough.
120. The cushioning pad assembly according to claim 120, wherein the laminate further comprises an inner fabric layer, the inner fabric layer allowing air to flow therethrough.
121. The cushioning pad assembly according to claim 113, wherein the laminate further comprises an inner fabric layer, the inner fabric layer allowing air to flow therethrough.
122. The cushioning pad assembly according to claim 113, wherein the laminate further comprises a radiant heat barrier layer.
123. The cushioning pad assembly according to claim 123, wherein the radiant heat barrier layer comprises an aluminized polyester.
124. The cushioning pad assembly according to claim 113, wherein the at least one impact absorbing layer comprises two impact absorbing layers, the two impact absorbing layers including at least one impact absorbing layer comprises at least one substrate of reticulated foam and at least one substrate of foam beads which are fused together only where the beads contact one another.

125. The cushioning pad assembly according to claim 125, wherein the laminate further comprises outer and inner fabric layers, the outer and inner fabric layers each allowing air to flow therethrough.

126. The cushioning pad assembly according to claim 125, wherein the laminate further comprises a radiant heat barrier layer.

127. The cushioning pad assembly according to claim 125, wherein the laminate further comprises a third impact absorbing layer, the third impact absorbing layer including at least one substrate of visco-elastic polymer.

128. The cushioning pad assembly according to claim 128, wherein the at least one substrate of visco-elastic polymer includes at least one air ventilation aperture.

129. The cushioning pad assembly according to claim 125, wherein the laminate further comprises at least one substrate of visco-elastic polymer.

130. The cushioning pad assembly according to claim 130, wherein the at least one substrate of visco-elastic polymer includes at least one air ventilation aperture.

131. The cushioning pad assembly according to claim 119, wherein the outer fabric layer faces toward the shell assembly and comprises a light color.

132. The cushioning pad assembly according to claim 121, wherein the inner fabric layer faces away from the shell assembly and comprises a dark color.

133. The cushioning pad assembly according to claim 112, wherein at least a second cushioning pad is detachably fastened to an inner surface of the at least one cushioning pad, the at least second cushioning pad comprising a laminate having at least one impact absorbing layer which allows air to flow therethrough.

134. The cushioning pad assembly according to claim 112, wherein the protective pad apparatus includes a shell assembly.

135. The cushioning pad according to claim 90, wherein the protective pad apparatus includes a shell assembly.

134. A shell assembly for a protective pad apparatus that protects a user's chest, back, and shoulders, the shell assembly comprising a plurality of discrete protector panels.

135. The shell assembly according to claim 134, wherein the protector panels include at least one inner shoulder protector panel, at least one chest panel fastened to a first end of the inner shoulder protector panel, and at least one back panel fastened to a second end of the inner shoulder protector panel.

136. The shell assembly according to claim 134, wherein shell assembly defines first and second halves.

137. The shell assembly according to claim 136, wherein the first and second halves are connected by a first protector plate.

138. The shell assembly according to claim 137, wherein the first protector plate allows the first and second halves of the shell assembly to move relative to one another.

139. The shell assembly according to claim 137, wherein the first and second halves are further connected by a second protector plate.

140. The shell assembly according to claim 139, wherein the protector plates allow the first and second halves of the shell assembly to move relative to one another.

141. The shell assembly according to claim 136, wherein the first and second halves of the shell assembly are connected to one another in a manner which allows the halves to move relative to one another.

142. The shell assembly according to claim 134, further comprising a belt strap system for securing the apparatus to a user, the belt strap system comprising at least one cushioning pad comprising a laminate having at least one impact absorbing layer which allows air to flow therethrough.

143. The shell assembly according to claim 134, wherein at least one of the protector panels includes at least one raised embossment.

144. The shell assembly according to claim 135, wherein at least one of the chest protector panel and the back protector panel includes at least one raised embossment.

145. The shell assembly according to claim 134, wherein the protector panels are a pearlized white metallic color.

146. The shell assembly according to claim 134, wherein at least one of the protector panels comprises at least one ventilation hole.

147. The shell assembly according to claim 135, further comprising at least one spring element for strengthening the at least one inner shoulder protector panel.

148. The shell assembly according to claim 147, wherein the at least one spring element is fastened to the shell assembly with fasteners that allow the spring element to swing laterally.

149. The shell assembly according to claim 147, wherein the at least one spring element includes an impact absorbing layer.

150. The shell assembly according to claim 134, wherein one of the protector panels comprises a lower shoulder panel fastened to the shell assembly by two straps that cross one another.

151. The shell assembly according to claim 134, wherein each of the protector panels has at least one of a predetermined size and a predetermined shape and wherein each of the protector panels can be individually replaced with a protector panel having at least one of a different predetermined size and a different predetermined shape.

152. A shell assembly for a protective pad apparatus that protects a user's chest, back, and shoulders, the shell assembly comprising a pearlized white metallic color.

153. A shell assembly for a protective pad apparatus that protects a user's chest, back, and shoulders, the shell assembly comprising at least one spring element for strengthening the at least one inner shoulder area of the shell assembly.